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The Massachusetts Audubon Society.

THE work of this society, founded three years ago for the protection of wild birds, has been active in circulating literature relating to them and in making known the provisions of protective bird laws, and has been conspicuously successful. It has now 1,747 life members, 330 associates, 20 life associates and 110 local secretaries. Following the lead of Massachusetts, Pennsylvania, New York, Illinois, Colorado, New Hampshire, Wisconsin and the District of Columbia have organized similar societies, and several other states are preparing to form Audubon societies. During the last year the Massachusetts Society has issued and freely sent out a number of publications relating to the protection of birds and it is now distributing at a trifling cost an illustrated paper by Miss Florence A. Merriam, entitled *How Birds Affect the Farm and Garden.*

In this publication gardeners who have not studied our native birds and their habits will find a great deal of useful information and that many of their preconceived ideas about our familiar birds and their damage to growing crops have been erroneous. Our common and friendly catbird, for example, is often prosecuted because it eats fruit, and although in some parts of the country it is to a certain extent a fruit-eater, one-third of its food is now known to consist of insects which annually destroy a large part of the farmer's and gardener's profits; even as a fruit-eater it has been demonstrated that it prefers wild fruits to cultivated, most of the complaints of depredations against the catbird coming from those parts of the country where wild fruit is scarce, and actual experiment shows that it prefers red mulberries to cherries and strawberries. The kingbird, having been long accused of destroying honeybees, a careful examination has been made of 218 stomachs of this bird. Insects were found to form about ninety per cent of the whole food, but only fourteen of the 218 stomachs contained any trace of honeybees, while it was found that it had destroyed a number of the bees' worst enemy, the robber fly, which has been known to kill 140 honeybees in a day. The kingbird, too, feeds upon other harmful insects, the gad fly, the Clover-leaf weevil, the destructive Rose chafer, ants and grasshoppers.

The chickadee is shown to be a voracious feeder on the eggs of the canker-worm; and the crow, although he does pull up some corn and is too often maligned and abused, does infinitely more good than harm. Twenty-six per cent of his entire food has been found to consist of insects, most of which are grasshoppers, may-beetles, canker-worms and other species injurious to growing crops. He is a great devourer, too, of field-mice and other harmful rodents, and he is one of the best scavengers. Greater injustice even has been done to hawks and owls which are persecuted unceasingly, although a majority of them work night and day to destroy the enemies of the husbandman. There are only three common inland hawks in the United States which do any damage; these are the goshawk, which is rare in this country, except in winter; Cooper's, or the chicken hawk, which is destructive, especially to doves, and the sharp-shinned hawk, which feeds principally on small birds. The other so-called birds of prey in the United States are mainly beneficial, and their protection and preservation are of extreme importance. Their food consists largely of meadow mice, rabbits, chipmunks, small snakes, grasshoppers, spiders and centipedes. Swainson's hawk is the great grasshopper-eater in some of the western states, and it has been estimated that 300 of these birds have saved in a month sixty tons of produce that grasshoppers would have destroyed. Owls, too, are great destroyers of small rodents, and the story is told of the nest of one pair of barn owls from which 454 skulls were taken, of which 225 were meadow-mice and 179 house-mice.

Miss Merriam, although she pleads so eloquently and logically for the preservation of our native birds, regards the introduction of the English sparrow into this country as an unmitigated evil. First introduced in 1850, it has now become established in thirty-five states and territories, and has been shown to interfere with seventy kinds of our native birds, most of which build their nests in the neighborhood of houses or in gardens, and are beneficial to the farm and garden. An examination of 522 stomachs of the English sparrow has shown that it feeds principally on wheat, oats and corn, and is but little interested in insects, and that when it does eat insects these are more often beneficial than injurious. It would seem clear then, as Miss Merriam insists, "that the English sparrow should be exterminated, that laws protecting him should be repealed, and that some intelligent systematic action should be taken to rid the United States of his obnoxious presence. Bounty laws cannot do this, for, as has been clearly demonstrated, they do more mischief than can be easily remedied, as money is usually spent on the heads of the valuable birds that have been mistaken for the injurious ones. Small boys also are likely to do more harm than good by destroying the wrong birds, but the work might be effectively done by state boards or commissioners, who should hire trained assistants to destroy the birds in their nests."

The food of a large number of our common native birds is discussed in the pages of this publication, but we have said enough to indicate its value to the farmer and gardener and to show the character of the work which the Massachusetts Audubon Society is doing. Not less successful have been its efforts in preventing the use of the feathers of wild birds in female decoration, and every one becoming a member of the society is expected to agree not to purchase or encourage the use of feathers of wild birds for ornamentation. This, however, does not interfere with the use of ostrich plumes, which are now beautifully dyed for the milliner's trade, the feathers of the different species of barnyard fowls, and the plumage of ducks and peacocks.

Audubon societies and clubs should be founded in every city and town to excite interest in birds, and all school children should be taught their habits and value. Clubs and societies desiring speakers on the subject of birds and their protection may obtain names by addressing the Secretary of the Massachusetts Society, Miss Harriet E. Richards, at the Boston Society of Natural History, Boston, from whom the various publications of the society and suggestions and advice can be obtained.

The aims of associations like this and the work of their members are indications of a high order of intelligence and civilization in any community, and such unselfish and patriotic effort deserves the encouragement and assistance of the public.

The withdrawal from sale and entry of all Government land more valuable for the production of timber than for other purposes was recommended by the Commission appointed by the National Academy of Sciences to study, at the request of the Secretary of the Interior, a forest policy for the United States. The proposition was considered radical by many persons, but now it has been endorsed by the National Irrigation Congress at its recent meeting in Lincoln, Nebraska, which finds that "the perpetuation of the forests of the arid regions is essential to the maintenance of water-supply for irrigation as well as for the supply of timber for industrial needs, and resolves that the President of the United States shall be memorialized, so soon as a proper and adequate form of administration shall be provided, to withdraw from entry and sale under the Act of Congress of March 3d, 1891, all public lands which are of more value for their timber than for agriculture or their minerals." This is particularly interesting, showing as it does a great change of public opinion since the time, still recent, when some of the most influential advocates for Government coöperation in providing irrigation for the west urged that as forests were detrimental to the flow of streams they should be destroyed. It seems to show, too, that the real opposition to a conservative national forest policy comes from the great corporations who derive large profits from plundering the Government and from their paid attorneys in Congress, and confirms our own observations that a large majority of the people living in the western states and territories are anxious for the preservation of the national forests and opposed to the selfishness of the mining and timber-cutting companies. Unfortunately, however, the opponents of greed and depredation are not as well organized as the plunderers, and they are without proper representation in Washington. Public opinion, however, is gradually changing on the subject of forests in the west as well as in the east, and the time will come when the present era of wanton forest destruction will be regarded as one of the serious blots upon the intelligence and foresight of the American people.

Notes on Cultivated Conifers.—IV.

In the last number of these notes we described those Junipers of the section Oxycedrus which can be grown in northern gardens. More important than these are the species included in the section Sabina, distinguished by the scale-like crowded leaves closely appressed and adnate to mature branches, while on seedling plants and frequently on vigorous shoots they are elongated, sharp-pointed, free and more or less spreading. To this section belong all the large and valuable species of both hemispheres and a few good garden plants, although most of these Junipers are natives of hot, dry regions and cannot bear the humidity of the Atlantic states. Eight, at least, of these arborescent Junipers inhabit the United States, and, with one exception, they belong to the west and south-west and to regions of scanty rainfall and long, hot, dry summers, and wherever Junipers of this section grow, except in eastern North America, Bermuda, the West Indian and Atlantic islands, and in Sikkim, the rainfall is unequally distributed and the soil is rocky and sterile.

One of the largest and most valuable of the entire genus, however, Juniperus Virginiana, which is a native of the eastern United States, is one of the handsomest and most desirable coniferous trees which can be cultivated in this climate. Common from Nova Scotia to southern Florida and central Texas, and from the shores of the Atlantic to the valley of the Missouri River, the Red Cedar, as this tree is universally called, assumes many forms under the various conditions of its surroundings. In the valley of the Red River in Texas and Arkansas it is sometimes a hundred feet high, with a tall straight trunk three or four feet in diameter; usually it is much smaller, however, and generally forty or fifty feet in height. Sometimes, especially during its early years, the slender branches are pressed close against the stem from the base upward and form a narrow pyramidal head, which in time usually broadens out and finally becomes round-topped and very irregular. This pyramidal form is especially common in the valley of the Hudson River and in some parts of New Jersey and eastern Pennsylvania; in New England, after the first twenty or thirty years, when the Red Cedar is nearly always pyramidal, the stems often become naked below and the head a broad-based pyramid of slender branches spreading below nearly horizontally and ascending above; and in the swamps of Florida, where this tree is common and grows to a large size, the branches are long and often pendulous. The foliage of the Red Cedar is dark yellow-green, or often pale glaucous, becoming bronze-colored at the north during cold weather, and in autumn and winter, when birds do not eat them, the branches are loaded with the small berries, which are covered with a handsome whitish bloom.

Juniperus Virginiana has usually been considered to cross the continent to the shores of Puget Sound and Vancouver Island, and to be pretty widely distributed through the interior Rocky Mountain region from the northern border of the United States to northern New Mexico and Arizona. After having seen, however, a good deal of this western tree during the past two seasons, I am inclined to believe that the so-called western Red Cedar as it grows in Wyoming, Montana and Colorado, at least, and perhaps everywhere, will have to be considered another species, and should this supposition prove correct on further investigation, I should propose the name of Juniperus scopulorum for it. The habit of the Rocky Mountain tree is very unlike that of any form of the eastern Red Cedar, as may be seen in our illustration on page 423 of this issue, which represents a tree near the Mammoth Hot Springs in the Yellowstone National Park, where this Juniper is very common, and the only arborescent species, and where it grows on gravelly slopes at elevations of six or seven thousand feet with Pinus flexilis. It has the slender branchlets and opposite leaves in pairs of the eastern tree, but the fruit is larger, and does not ripen until the second year, while that of our Red Cedar ripens during its first autumn. The branches are stouter and covered with more scaly bark, and the bark of the trunk, which is often forked near the ground, is unlike that of the eastern tree, which separates into thin narrow scales fringed on the margins, but, like that of some other western Junipers, divides into irregular, narrow, connected flat ridges, which break up on the surface more or less freely into persistent shreddy scales. The wood has the same fragrance as that of the eastern tree, although it is rather less powerful, and the color is a duller red. The habit and the character of the bark may be due, perhaps, to differences of soil and climate, which might also affect the color of the wood, and the only really tangible character by which the western tree can be separated from the eastern is the biennial fruit. The fact, moreover, is significant that unless the eastern and western trees come together in north-western Nebraska, the meeting place of the eastern and western floras, they are separated by a continuous belt of country through the middle of the continent several hundred miles wide; and moreover, with the exception of Juniperus communis, which encircles the northern hemisphere, and the White Spruce, which crosses this continent far northward and reaches the Pacific coast within the Arctic Circle, no coniferous tree grows in both eastern and western North America. But before the question of the distribution of the Red Cedar can be satisfactorily determined more observations should be made on the time of ripening of the fruit,

especially in Colorado, Utah, New Mexico and Arizona, in the valley of the Columbia River and on Vancouver Island, for it is, of course, possible, although hardly probable, that the proposed Juniperus scopulorum may be confined to the northern Rocky Mountains and that Juniperus Virginiana really reaches the southern part of that range and even the Pacific coast.

So much has been said in the columns of this journal about the value of Juniperus Virginiana as an ornamental tree that it seems unnecessary to say more on the subject. Certainly no other hardy conifer can be used here so successfully to produce the effects which are obtained in countries of milder climates by the employment of the fastigiate Cypress of southern Europe, and no other tree is more formal in one of its forms and more picturesque in an other. None of our trees are better suited to cover a rocky knoll, or, mingled with trees of less formal outline, to give interest and variety to the landscape.

The Red Cedar, although usually regarded as a slow-growing plant, increases rapidly with generous treatment; it is easily transplanted while young from upland pastures or from the borders of fields and roadsides, where birds industriously sow the seeds, and with care plants ten or twelve feet high can be safely transplanted, although an idea prevails in this country that the Red Cedar is difficult to move and unsuited for cultivation.

Many varieties of the Red Cedar are found in gardens, nurserymen propagating them by means of cuttings. Most of these, however, are hardly distinct enough to warrant attention, the only conspicuous varieties being those with glaucous foliage (var. glauca), one with pendulous branches descending along the stem (var. pendula) and one of the best of all the weeping conifers, a dwarf form (var. globosa), and forms with leaves more or less disfigured by yellow or white markings. Juniperus Virginiana gracilis, usually known in English gardens as the Bedford Juniper, is distinguished by slender, somewhat pendulous branches and bright green foliage; it is a plant of somewhat doubtful origin, and may have come from Florida, as it is tender even in England. If it has been tried in our northern gardens, it probably has not survived in them.

Juniperus Chinensis, which is occasionally found in our gardens and is perfectly hardy as far north as eastern Massachusetts, is in every way inferior as an ornamental plant to the native Red Cedar which it somewhat resembles, and at the end of a few years usually becomes ragged and shabby in appearance. But this species is interesting, however, in the difference of the foliage of the staminate and pistillate plants, at least while young. On the male plant, which has usually erect much-divided branches, the leaves are usually in threes, acicular, rigid, spreading, and bright green or glaucous, while on the female plant, which has longer and often pendulous branches, the leaves are scale-like, closely appressed, opposite in pairs, and glaucous-green; the two forms, however, are frequently found on the same individual, and on old trees in Japan the leaves are all scale-like and rather glaucous. Juniperus Chinensis is widely distributed in eastern Asia, from the borders of Thibet to Japan, where it does not appear to be generally scattered, although it is common on the high volcanic ridges at the base of Asama-yama in central Hondo; here it becomes a shrubby tree thirty or forty feet high, with straggling contorted branches and gray-green leaves. Two venerable and picturesque specimens, seventy or eighty feet high, with hollow trunks some six feet in diameter, before the temple of Zenkôgi, in Nagano, show that this Juniper sometimes attains a large size. In gardens there are forms of Juniperus Chinensis with bright yellow and with white marked foliage; these are slow-growing and rather delicate plants of no particular value or interest. Another form, usually known in gardens as Juniperus Japonica, is in early life a compact bushy plant with many erect branches and acicular blue-green leaves. This shrub, which is probably a product of Japanese horticulture, as it is often cultivated in Japanese gardens, is perfectly hardy and very distinct in appearance from other Junipers; retaining for several years its peculiar compact juvenile habit, it too often becomes thin and ragged before it is a dozen feet high and loses its value as an ornamental plant. There are varieties of this form in which the young branches with their leaves are yellow or white. This is, perhaps, one of the most difficult of all conifers to transplant.

By many recent authors the so-called Juniperus Japonica, which does not appear to be known in a wild state, has been confounded with the prostrate littoral Juniper of Japan and Corea (Juniperus procumbens, Siebold.—Juniperus Chinensis procumbens, Endlicher), now usually considered a variety of Juniperus Chinensis, although perhaps it will, when better known, be found distinct enough to be given a specific position. This seashore plant forms dense mats on low grassy bluffs fully exposed to ocean gales, sending out for long distances its prostrate creeping stems clothed with bright green scale-like leaves. From seeds gathered near the Aino village of Horobetsu, on the coast of Yezo, a number of plants have been raised in the Arnold Arboretum, but it is too soon to speak of their hardiness.

Another prostrate Juniper (Juniperus Sabina, var. procumbens) is an excellent garden plant with wide-spreading stems which hug the ground and are clothed with bright green foliage. This is now usually considered an American variety of Juniperus Sabina, which is an erect shrub or small bushy tree, occasionally twelve or fifteen feet tall, and is widely scattered through central and southern Europe and Siberia. If it has ever been properly tried in our gardens it has probably not proved hardy. The American plant is distributed from southern Maine to the shores of Hudson Bay, and westward in British America from Newfoundland to the Rocky Mountains of southern Alberta, and through northern New England and New York along the shores of the Great Lakes to northern Minnesota and over the mountain ranges as far as the eastern slopes of the Rocky Mountains in Montana. This is the hardiest and most beautiful of all the prostrate Junipers which can be grown in our gardens, where it might well be seen much more frequently than it is.

The prostrate form of the Himalayan Juniperus recurva (var. squamata) is a favorite garden plant in Europe, and has frequently been planted in this country. In Massachusetts it is not very hardy, although it can be made to grow in sheltered shady positions; near New York and southward it is, however, perfectly hardy. Juniperus recurva, which is widely distributed from Afghanistan to Sikkim and Bootan, is sometimes tree-like, but at high elevations remains shrubby and covers large areas with long decumbent stems running on or just below the surface of the ground and sending up numerous short erect branches.

Considering the number of species and forms of Juniperus and the attention which has been given in other countries to preserving all its abnormal forms, the genus has contributed comparatively little to our gardens, and as an ornamental tree for eastern America no other species or variety compares with our native Juniperus Virginiana.

C. S. S.

The St. Croix River.—I.

MAINE AND NEW BRUNSWICK.

IT is a far cry from the western St. Croix River to the St. Croix River on the eastern boundary of the United States, but there is a kindred beauty in the forests which border them.* The same flowers bloom near them, the dancing foliage of Birches and Rowan, the stern symmetry of Fir and Spruce are similar in both. But there is a quieter stateliness about the Maine river as it opens out into the broad bay of Passamaquoddy, with its myriad islands, and a more majestic flow in its tide, which rises to unusual height from the influence of the Bay of Fundy. There is,

* See Dalles of the St. Croix, Wisconsin and Minnesota (Garden and Forest, vol. x., page 330).

too, a richness of red color in its beaches and rocks, which gives the landscape a depth of tone rare in a northern latitude, while the clear atmosphere lends sharpness to outlines and affords a wide perspective. The scene is most beautiful when the soft autumn hazes slightly veil the lofty hills and enhance the mystery of the blue distance. When mingled, as it too often is, with the smoke of burning forests, this haze adds a purple tint to the headlands like the enchanted mantle Vesuvius spreads over the jagged lava crests which encircle the Bay of Naples. To one who sails up and down the river the differing views rival each other in charm. Descending, there is seen the gradual widening of the stream and an increasing dignity in the bluffs which rise on either hand; returning at evening up the slowly narrowing channel, the heads of the high hills are violet against a golden sky. Though there are other scenes more rugged and wildly picturesque, few exceed this in noble, tranquil charm.

Some years ago forest fires and the devastation of lumbermen had left the banks of the St. Croix stripped and desolate, and had thrown into mournful relief their rocky sterile fields and hillsides. Now gentle Nature has reclothed the dreary wastes. The Devil's Head is green with a young and vigorous growth, above which rise here and there to a great height the gaunt skeletons of burned Pines which show how tall the virgin forest once was. This gradual reforesting of the burnt lands of Maine and New Brunswick is very apparent along the railway from Bangor which leads to the headwaters of the St. Croix. Where ten years ago there was but a blackened waste countless numbers of Ashes, Maples, Birches, Moosewoods, Larches, Hemlocks and White Pines are now springing up, interspersed with stiff young Spruces and Firs. The wet lands and scorched moors are hidden by Blueberry-bushes and Alders, and everywhere the red berries of the Dwarf Cornel glow amid their whorls of foliage. Behind St. Stephen, New Brunswick, are piled high ridges of hills, from which one has a wide view over the broad desolate landscape now fast recurring to woodland. To the eye accustomed to the rounded outline of clumps and masses of trees, the serrated edges of the Firs and Spruces climbing up and down the hills seem strange and harsh. The Balsam Firs (Abies balsamea) send their top shoots into the air, and sometimes for two or three yards their branches are so short and widely separated that they are almost as unlike trees as the telegraph poles. The groves of Spruce (Picea rubra) are sombre and funereal. The bluer, pale, glaucous hues of the White Spruce (P. alba) here and there give a brighter tone to the clearly massed ranks of evergreens, or the Hackmatacks (Larix larcina) interweave the dark warp with a woof of feathery lightness. Hemlocks (Tsuga Canadensis) abound, and their graceful forms and delicate foliage make them the queens of the forest wherever they appear. Where the sun can reach them, on the hillsides and on the edges of the swamps, wave the serrated leaflets of the Mountain Ash (Pyrus Americana), whose tops at this season are gay with shining bunches of scarlet berries.

All these trees are found in profusion on the banks of the St. Croix, many of them growing apparently from the heart of the solid rock. Along the sheer banks of the cliffs which rise directly from the salt tide, I saw blocks of stone cleft by the pressure of the strong roots as if by the tools of a quarryman, lying in square masses where they had been hurled down the slope by the force of the vigorous shoots. What these trees live on, beside the rain from heaven, is always a mystery, but they are undaunted by the hard conditions of climate and soil, and though they grow very slowly they still live and thrive where no one would believe a living thing could find sustenance.

Salmon Falls, a mile above the head of navigation of the St. Croix, were beautiful within my memory, and along the banks of the river at the point where they roar and tumble over the rocks into the basin below, I well remember the conical bark wigwams of the Passamaquoddy Indians which I used to wonder at in my youth. A remnant of the tribe still haunts the old grounds, but their homes are no longer picturesque. Tumble-down old sawmills vex the course of the stream, and their refuse and sawdust form little islands on which tall bushes, and even trees, grow freely. At Calais the tide rises twenty-five feet, and when it falls leaves but a narrow channel between wide stretches of mud-flats, so that the river's beauty ebbs and flows periodically for a mile or two. But lower down, the pebbly or sandy beaches of vivid red which alternate with the high bluffs of differing shapes, are always fine, even when the tide has receded to its utmost limit.

This river was discovered and named by the French, under Pierre du Guast Sieur de Monts, in 1604. The name Ste. Croix was then given to it on account of the two branching arms made by the mouths of two rivers visible from the little island on which the small garrison established itself and built a fort and houses, which one finds rudely portrayed in *Champlain's Voyages*. One of the arms on the British side is now known as Oak Bay, and into it flows the River Warweig, from the valley of which rises a curious group of round, heavily wooded hills, clustered together in a way that suggests some extraordinary convulsion of Nature, or a Titanic game of bowls, with the balls left deserted in a huddled mass. From the lofty ridge in New Brunswick, which overlooks this singular scene, the view is remarkably beautiful. Landward, great moor-like stretches dotted with woods reach away in every direction to a far-distant horizon line, broken here and there by faint purple hills, and directly below one's feet are seen lying the round or conical dark hills, clustered together and often actually rising from the waves. Over the tops of them in the shadowy distance are visible the blue waters and the far-away shores of the myriad islands of Passamaquoddy Bay. Just above St. Andrews, New Brunswick, the highest mountain of all, Chamcook, lifts a bare red top from a fringe of encircling woods. Its old red sandstone formation shows this hill to have been one of the early upheavals on the continent, and although it is not five hundred feet high, nothing grows upon its summit. From it one has a comprehensive view of all the surrounding region on both sides of the St. Croix, dotted with myriad lakes, and can behold the broad bay with its hundreds of islands of varying extent.

Hingham, Mass. *Mary C. Robbins.*

Foreign Correspondence.

London Letter.

Miscanthus.—We have in cultivation at least three, possibly four, of the six or seven known species of this genus. They are better known under the name of Eulalia, now sunk under Miscanthus, a near ally of the Sugar-cane, Saccharum. These ornamental plants are useful in the mixed border or as isolated specimens on the lawn. The oldest species cultivated in gardens, Miscanthus Japonicus, is now represented by three distinct forms. The type has culms six or eight feet high and three-eighths of an inch in diameter; these are clothed with elegantly curved leaves three feet long and about an inch wide, glabrous above, hairy beneath, the sheaths also hairy, the midrib white, the other portions bright green. In the autumn they bear terminal erect panicles of purplish flowers like those of the Sugar-cane or the male plumes of the Indian Corn. The variety Zebrina has leaves like the type, with the addition of broad, irregular, transverse bands of yellow. The third form, called Japonicus variegatus, is a plant of especial beauty. Its culms are six feet high and a quarter of an inch in diameter; the leaves are from two to two and a half feet long and from half an inch to an inch wide, glabrous both in blade and sheath, the former green with a central stripe of white and broad marginal bands of creamy yellow. I suspect this is another species, and not a form of M. Japonicus, but it has not yet flowered. According to Walters, who collected M. Japonicus in Formosa

in 1882, it is grown by the Chinese for fuel and thatching, and is a large stout Reed. M. Sinensis is distinguished by its shorter, thinner culms, which at Kew attain a height of five feet and are less than a quarter of an inch in diameter, while the leaves are two and a half feet long, a quarter of an inch wide, channeled their whole length and shining green, with a white stripe along the midrib. The sheath is glabrous and covered with a wax-like bloom, and there is a tuft of long silky hairs on each side of the ligule. This species is a native of China and Japan. It was introduced by the French horticulturists in 1889 under the name of Eulalia gracillima, var. foliis univittatis. Under the name of M. Ogi we have a third species which was introduced from Yokohama in 1895. It is as hardy as the others, larger than they are, and at least as handsome. In the Bamboo garden at Kew it has formed a cluster of about fifty stems nine feet high and half an inch in diameter, the leaves three feet long, one and a half inches wide, and dark green, with a white stripe along the midrib, the sheaths glabrous and tinged with purple, the ligule bearded. It promises to be a plant of exceptional value in the garden. The specific name looks like Chinese or Japanese vernacular. Possibly it is M. sacchariflorus, a native of Peking and other parts of China. Planted in strong deep soil, where they will get plenty of moisture and sunshine, these plants are seen at their best and show to advantage in comparison with those grown under less liberal treatment.

PHRAGMITIS COMMUNIS VARIEGATA.—This is a highly decorative variety of the common Reed, the Arundo Phragmitis of Linnæus. A small plant of it was presented to Kew four years ago by Messrs. Wallace & Co., of Colchester, and it is now a mass of stems ten feet through and six feet high, clothed with leaves a foot long, an inch wide, and green, striped and margined with creamy white, the sheaths partly rose-purple, partly green, and the band round the ligule black-purple. It is by far the most ornamental form of this Reed known to me, and it is an ideal plant for the water-side. It was, I believe, found by Dr. Wallace as a sport from the type, which is common in wet places in this country, and he took it into his garden and found the variegation was permanent. Possibly the stems would grow to a height of eight or ten feet in a warmer situation than the margin of the lake at Kew. It must not be confused with the Gardener's Garters, Phalaris arundinacea.

LAPORTEA CANADENSIS.—I lately saw a large quantity of this plant under cultivation in the Jardin d'Acclimatation,

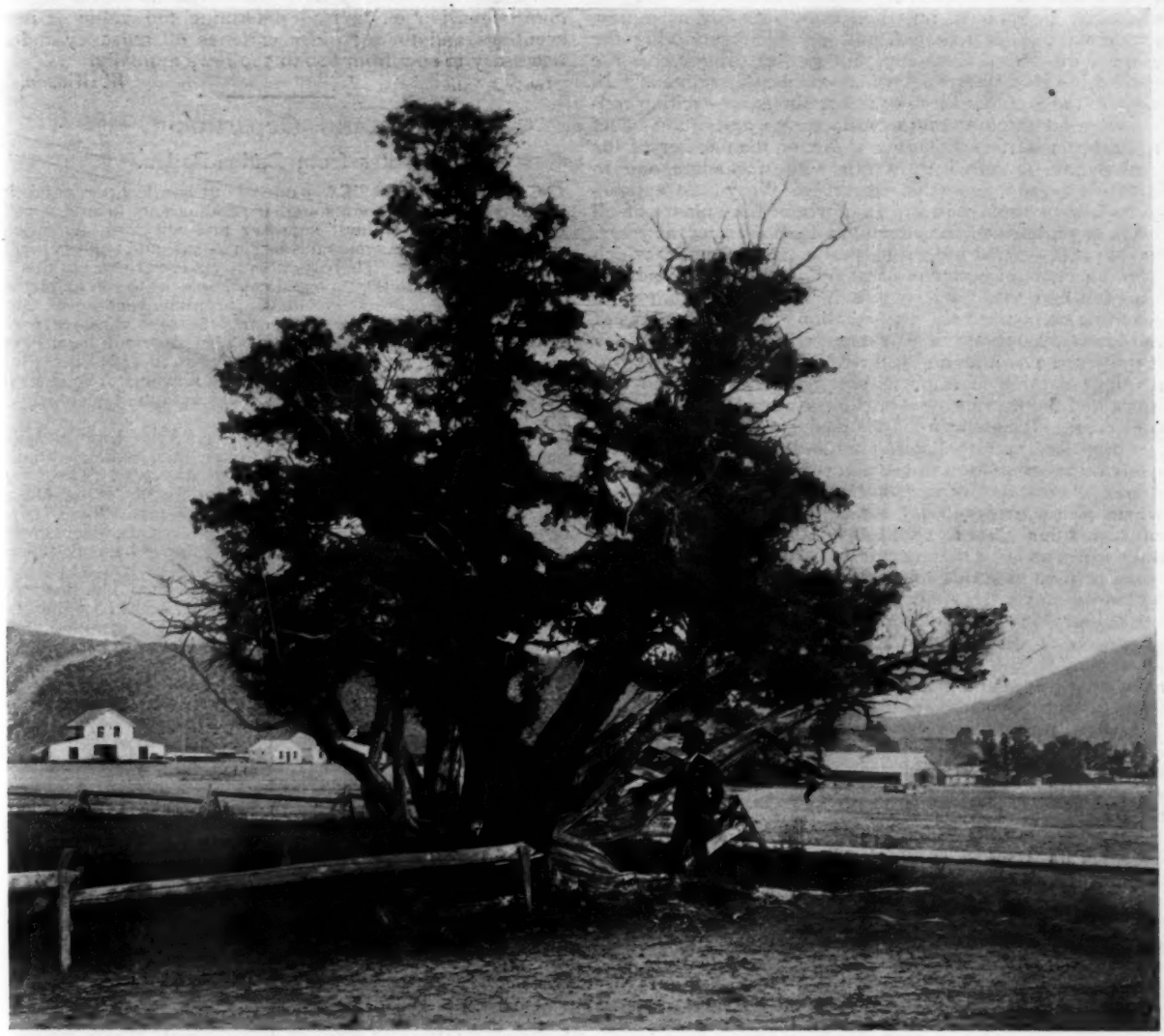

Fig. 54.—Juniper in Yellowstone National Park.—See page 420.

Paris, and on inquiry I was told by Monsieur Patry, the superintendent of those exceedingly well managed gardens, that it was being distributed to the French colonies as a silk-fibre plant, and that in this respect it is superior to the China Grass, Bœhmeria nivea, and to Ramie, B. tenacissima. It has been found to grow more freely and to be less difficult to manipulate than either of these two plants, which, according to Monsieur Patry, have consequently been abandoned in its favor by the French planters. I see that this species is a common weed in various parts of North America, and that its fibre has been utilized for textile purposes. In the *Treasury of Botany* it is stated that L. Canadensis is a native of the Alleghany Mountains and that "it has lately (1884) been imported into Germany as a new textile plant; it is perennial and capable of enduring the climate of central Germany, but further experiments are needed ere its commercial value can be determined." In view of the fact that these silk-fibre plants are exciting considerable attention among manufacturers, and of the belief in France that this Laportea is better than either of the Bœhmerias, it would be worth while for some one in America to investigate its properties. Very little appears to be known about it in England, where fibre plants of all kinds have received considerable attention in recent years.

Tigridias.—What are the natural conditions under which Tigridia Pavonia grows in Mexico? Cultivators generally treat this and the other species of Tigridia as plants that require a comparatively dry situation. In the gardens of the Earl of Ilchester, at Abbotsbury, however, T. Pavonia is grown in a swamp and it thrives amazingly, growing to a height of three feet, the leaves large, healthy and lustrous, and the flowers almost as large again as one usually sees them. It has been in this position several years and has increased rapidly. Possibly this is a case in which the cultivator is more kind to the plant than Nature can afford to be. An instance of this character is Begonia Socotrana, which Nature grows in dry hot sand; in the hands of the cultivator this plant is happiest, that is, it grows at least three times as large and bears enormous crops of flowers, when planted in strong loam, freely watered and kept in a hot, moist stove. Another such case is Stapelia gigantea, the largest flowered of all the carrion plants. At Kew it is grown in a stove with Crotons, Dracænas, etc., where it blooms freely, and it is now coming into flower. On seeing our plants a few days ago a Cape botanist exclaimed that this method of cultivation would kill the plant. But, in a house where succulents are grown at Kew, it grew indifferently and never flowered. By the way, cultivators of Stapelias, plants which often fail to grow, may like to know that altogether the best method I have tried is to plunge the pots containing them during the summer in cinder-ashes in a frame facing south, where, in warm weather, the lights are taken off. The Kew collection has improved astonishingly under this treatment.

How New Peas are Raised.—The history of garden vegetables is a subject of absorbing interest. Darwin devoted much attention to them in his *Animals and Plants under Domestication*, a work which, I venture to think, present-day horticulturists might study with advantage. In the course of a lecture by Mr. A. W. Sutton, of Reading, on the progress in vegetable cultivation during the last sixty years, it was stated that a seedling Pea is now generally the result of so much interbreeding that many distinct types will be represented in the ultimate cross. This cross will give a pod containing from six to ten or more seeds, and it is at this point that the work of the hybridist ceases, and that of the selector commences. When sown these seeds will in all probability produce as many distinct seedling Peas, some partaking of the character of the parents and some not. Seed saved from each of these frequently varies in each case to such an extent that the greatest patience is required in order to secure any fixed type at all. Some will be tall, some dwarf; some early, others later; some large podded, some small; some pale green in color, some dark; some curved in the pod, some straight; some pointed at the end and some square; and last, but not least, some may be round-seeded and some wrinkled. The selector must therefore begin again, and starting from the most promising plant in each row, endeavor to build up a seedling plant which will reproduce itself from seeds without variation, a task often extending over many years. While the garden Pea has been enormously improved during the last sixty years, Ne Plus Ultra, raised fifty years ago, is still, perhaps, the best of all tall late marrow-fat Peas. Another popular favorite now is Veitch's Perfection, introduced in 1859. American Wonder, introduced by Messrs. Sutton in 1881, is still more extensively grown than any other dwarf wrinkled pea. Mr. Sutton also stated that in order to make their Pea trials comprehensive enough to determine the value of new seedlings, and to test older varieties offered, they find it necessary to sow from 600 to 700 rows annually.

London. *W. Watson.*

Cultural Department.

Notes from Baden-Baden.

Scabiosa caucasica is one of our hardiest perennials in all soils and positions, and it produces its beautiful pale blue flowers throughout summer and autumn. A variety called Connata or Elegans has larger petals, and is altogether a more robust plant. There is also a white variety, but this is more delicate than the type and capricious as to soil and treatment. I have worked constantly for many years on S. Caucasica connata, sowing and selecting the best varieties, even though the variation was slight. This season I have been successful in getting a plant with bright deep ultramarine flowers, and another with pure white flowers. The latter is very robust and much more valuable than the typical white-flowered form.

Incarvillea variabilis has been in flower since June, and is a plant well worth growing. It is half-shrubby, making a round bush three feet high and of the same diameter. The main stem branches into many divisions, the ends of the branchlets bearing the flowers, which are bright purple and about the size of those of a florist's Pentstemon. The leaves are bright green and deeply cut. It is quite hardy and flowers the first year from seed.

Among Kniphofias, a new species, K. Tysoni, has flowered here; it is a large stately plant, with rather short bluish green leaves at least five inches broad and two feet long. The flowers, although not gaudy, are bright brick-red, changing to white.

Crocus pulchellus was in great beauty some time ago, with soft purple flowers, faintly striped. At this time, October 10th, C. Marathoniseus is showy, its pure white flowers being brightened by a few orange blotches and the broad orange pistils. Polygonum sphærostachyum still throws up its handsome spikelets dressed in bright aniline-red.

Baden-Baden. *Max Leichtlin.*

Ornamental Grass Beds.

It is rather puzzling to know why so many Coleus, Alternantheras and annuals are used in our public gardens and parks year after year when there are many other plants of as easy cultivation and much more pleasing. Beds of Coleus are little more than patches of gaudy color, with which one is quickly satiated. In this locality there are beds planted permanently with Grasses; these are made to look different each year by introducing various species of moderately tall flowering and foliage plants. In planting with Grasses the tall Reed, Arundo donax, is given the central position; next in height is Erianthus Ravennæ, and the varieties of Eulalia Japonica with Arundo donax variegata come next. Eulalia univittata follows in this order, and if smaller Grasses are needed, some of the variegated Arundinarias, Pennisetum longistylum, Elymus glaucus and Festuca glauca, the last-named being quite a dwarf variety. All of these Grasses are hardy here, and the plants should be placed far enough apart so that there will be no necessity to change them for several seasons.

If it is desired to use only Grasses and allied plants we have Cyperus Papyrus, which grows next in height to Erianthus Ravennæ. The color of this Cyperus is a rich dark green, unlike that of any other Grass. The purple form of the Sugar-cane, Saccharum officinarum, var. violaceum, can be depended on to grow at least five feet in a single season and form a neat bushy plant. Cyperus alternifolius attains a height of from three to four feet, and Pampas Grasses from two to four feet,

according to the variety. The lemon-scented Grass, Andropogon citratum, soon makes a dense growth several feet in diameter and two feet high. All of these tender plants, with the exception of the Cyperus Papyrus, are kept over winter in a half-dormant condition. The Cyperus should be kept moving, but only one or two plants need be taken indoors when there is sufficient accommodation for propagating it. The best method is to put some growths with the roots shortened back into the damp sand of a warm propagating-house; they will put out strong working roots in a few days. If potted and kept growing in soil which contains a good quantity of chopped sphagnum-moss, the plants will form grassy growths which should be torn apart and treated in the same way as the parent pieces. From one plant at the start several hundred may thus be had by planting-out time.

If flowering-plants are desired for use with the Grasses the large-flowered Cannas are pleasing. These are becoming so abundant in variety that several of the old kinds are almost lost sight of. The old C. Ehmannii is unsurpassed for rich leaves and flowers; the large flowers are in nodding spikes, with little or none of the seedy appearance common to most of the newer varieties. This variety grows from four to six feet high. While the common kinds keep well over winter when dried off, C. Ehmannii is best wintered when kept slightly moving. Hibiscus coccineus, a noble herbaceous species from the southern states, thoroughly hardy here, and probably so in most places if a little protection be given to the roots, should head the list of the most desirable tall-growing herbaceous plants. Specimens with single stems will grow to a height of about eight feet; by stopping the growths early in the season low and bushy plants may be had. The flowers are bright scarlet, larger than those of the forms of the shrubby H. rosa-sinensis. The leaves are five-parted on long stalks. Altogether this is one of the best plants to use with the Grasses. In places where it is not hardy, the roots being thick and of a succulent nature, they may be treated similarly to those of the Dahlia. For dark foliage plants we have Black Beauty Canna from two to four feet in height, and Strobilanthes Dyerianus, from one to two feet high.

Botanic Garden, Washington, D. C. *G. W. Oliver.*

[It is usually a mistake to grow the various Grass species closely together either in masses or lines, as is too often the practice. The charm of these plants consists mostly in the beauty of form found in the graceful lines of their leaves and stems. While many individual species of Grasses are handsome, hardly any two compose well in garden borders, unless, possibly, when it is desired to clothe the ground with a low-growing Grass or with a Carex, under some of the nobler species. But otherwise each species should stand in isolation, for, aside from preventing confusion of form, there are no plants whose lower parts require less masking than the Grasses, Sedges and Bamboos. Even the tall Cyperus pungens, which has smooth round stems six or seven feet high, and only a crown of leaves at the top, is much more effective unmasked, and one certainly would not give Papyrus Antiquorum a near neighbor to hide its sturdy stems. In fact, the same may be said of all the nobler or smaller Grasses, tender or hardy, and no plants will better repay thoughtful care in the selection of their location in the garden.—Ed.]

Grafted Stock for Roses.

LATELY I have had frequent opportunity for noting the advantages of using grafted stock for Tea and other Roses. The favorable conditions under which Roses have been grown in this country, and the facility and cheapness with which they can be propagated from cuttings have placed grafted plants at a disadvantage. The grafted plants must be bought in most cases, owing to lack of skill and facilities for preparing the stock. Shrewd growers, with the Old World instinct, have never lost sight of the advantages of grafted stock, and the superior quality of the flowers grown by them has led to an increase in the number of grafted plants. Clear practical instructions for working the plants have been given in *The American Florist* by Mr. Robert Simpson. Grafted plants of American Beauty show by their increased vigor just how much of the bed is planted with them, and this is true of Tea Roses. The stock exercises an invigorating influence. Perhaps the most notable success has been with grafted plants of Mrs. Pierpont Morgan. Mr. Montgomery, of the Waban Rose Conservatories, thinks they owe their comparative freedom from the dreaded eel-worm to the continuous use of grafted stock, and cuttings from these plants are less liable to this pest. Only the Manetti is recommended for stock for Tea Roses. It is itself much of a perpetual, and on this account is preferred to all others. The Banksian has been tried; this is too rank, the plants become soft, and produce poorly-colored flowers, although it is an excellent stock for climbing Roses. The Brier Rose follows its natural bent, going to rest in winter.

Grafted plants differ in appearance from Roses grown on their own roots; the dark velvety leaves are more plentiful, and the long stems, which usually come only from the base on plants on their own roots, break from any part of the grafted plant. Where solid benches are used, grafted plants are of further advantage, as with a little trimming the plants can be carried over two or three seasons, a practice rarely possible with plants on their own roots.

Wellesley, Mass. *T. D. Hatfield.*

[The points in favor of grafted Rose stock have been strongly stated recently in horticultural journals in this country, but it has yet to be satisfactorily demonstrated that grafted stock produces any better results in the long run in America.—Ed.]

Correspondence.

Garden Annuals from the Plant-breeder's Standpoint.

To the Editor of Garden and Forest:

Sir,—Early in 1897, Professor L. H. Bailey sent to the seed firm which he thought catalogued the greatest number of annuals an order for a packet of seeds of every kind of garden annual, hardy and tender. About six hundred different sorts have been growing at Cornell this year, and I have been looking over the whole field from the plant-breeder's point of view. I dare say no one ever goes to a botanic garden and looks for a business opportunity in plant-breeding, as one might investigate any other commercial opening. Doubtless a man gets a reputation for pedigree Pansy seed because he loves Pansies and must grow them for his own pleasure and profit. Cross fertilizing is essentially an enthusiast's work and no one can be hired to be enthusiastic. Then, too, there is greater success to be won in working with popular favorites than in trying to introduce new plants, just as more kinds of Grapes are needed, rather than new kinds of Juneberries. Nevertheless, there are certain results which can be obtained only from comparative study of collections that are as complete as it is possible to make them.

I have made a list of the twenty-four most popular kinds of garden annuals. Half of these I have listed as old-fashioned, and the other half as the popular favorites at this time. Balsams (Impatiens), African Marigolds (Tagetes), Moss Roses (Portulaca), Stocks (Mathiola), Candytuft (Iberis) and Godetias are all old-fashioned flowers and are likely to be always cherished, though their greatest popularity is probably past. Their horticultural evolution seems to be finished. We have found out their limitations, and they have been so well developed that one may purchase just what is desired in the way of color, form and habit much as one would purchase manufactured commodities. The next six kinds of flowers were perhaps equally popular once, but are now neglected in the reaction against formality and artificial coloring. These are Datura, Prince's Feather (Amaranthus), Cockscomb (Celosia), Ageratum, Clarkia, and the summer Chrysanthemums. They also seem less versatile than the six first named. Their limitations are naturally closer and the named horticultural varieties are not so numerous. Prince's Feather had a general use in gardens, but the species of Amaranthus, which are cultivated for their foliage, are, nowadays, with the Ageratums, chiefly employed for the special purpose of making beds and borders. Even if the natural school were not in the ascendant, with its restricted and isolated use of flower-beds, I should feel compelled to exclude bedding plants from the present discussion. Their value is determined by a set of characters (behavior under the shears) which is unimportant in the case of the home garden.

Of the twelve kinds on this list of present favorites all, I think, are by nature entitled to permanent prosperity, and six at least are versatile to the point of bewilderment. Pansies, Poppies, Sweet Peas, China Asters, Phlox and the various species of Dianthus represent six entirely independent and non-competing types of beauty. Like and dislike, however, are matters of personal liberty, and from the present standpoint I shall try to leave out the element of beauty. Aside, then, from individual preference for one type of beauty, certain ideals of garden cultivation seem to be most nearly realized

by Phlox Drummondii. The varieties of Phlox are compact and neat in habit, have no untidiness of foliage after blooming, are hardy, easy of cultivation, prolific, continue flowering over a long season, and are lasting as cut flowers. The range of color is wide. In form Phlox presents little variation, the typical and the cuspidate being, perhaps, the two kinds commonly recognized. Sweet Peas, which have most of these traits of a popular garden favorite, with the added charm of fragrance, can consistently be placed in this list, although I exclude the Morning Glory and all other climbers, because Sweet Peas are much cultivated in the garden proper, while the fitting place for the Morning Glory is about the house. China Asters would be almost ideal if they were earlier. The general grower has neither time nor money to prolong their season by indoor starting and successive sowings. Whether the species has been pushed to its limits of earliness or not I cannot say. It is said that the China Aster is essentially a cool-weather plant. Of Pansies, Poppies and the Pink or Dianthus tribe I shall not try to define the limitations, and I hope they will never lack for appreciation, selection and education. The other half of the present list contains six kinds of plants with narrower limitations, and consequently less versatility, judged by the number of advertised named varieties. The California Poppies (Eschscholtzia) have a narrower range of color than the common Poppies, and I fear it is impossible to get them to speak through the glorious reds. Verbenas have about the same range of colors as the Phlox Drummondii, with little variation in form and a less desirable habit for ease of cultivation, but the advantage of fragrance. Petunias are also somewhat awkward to care for; their smell and touch are unpleasant to some, and fixation of character can never be as perfectly attained as in the other groups mentioned; and in the case of the double forms hand fertilizing is necessary. Coreopsis and the Corn-flowers have still narrower limitations, but I believe they are among the twelve favorite garden annuals to-day. Most persons will be content if these are not much changed. It is difficult to see any benefit to be derived from crossing three such distinct types as Corn-flowers, Sweet Sultans and Centaurea Americana, all of which belong to the same genus. Mignonette, with its special uses and the narrowest limitations of the twelve, completes my naming of the twelve garden annuals most popular at present. The lovers of Dwarf Nasturtiums, Gaillardias, Calendulas, Cosmos, Sunflower and Zinnia will think these deserve a place among the best twelve. I should include them in a list of eighteen.

I do not mean to say that this list of twelve contains the best annuals, but merely those most popular. They are not the twelve which are indispensable for my own garden. I also believe that this list excludes two that are most promising to the plant-breeder. Cosmos is comparatively new to the east, and we do not know its limitations, but all agree that it has great possibilities. The great need with Cosmos is the hastening of its blooming time. Zinnia, once a general favorite, but now neglected, has, I am sure, great possibilities. It must probably always have a deep flower, but it need not be stiff and formal. If the Japanese or the Chinese had had Zinnias to work with all these centuries we should now have some fanciful forms. The Zinnia and the Dahlia were not known outside of Mexico until this century. The tropical climate, it is said, is not suited to double forms, and people of the tropics are not garden lovers. The double Zinnias and Dahlias were among the most consummate expressions of the florist's art at a time when artificial flowers were the craze to the exclusion of forms that are loose, irregular and free. The color range of Zinnias is very wide, and of the yellow series, while China Asters have the blue. Zinnias are earlier than China Asters, and their profusion of bloom, lasting qualities and ease of cultivation are nearly ideal. Nobody wants them for cut flowers, but that is because stiff and formal flowers are out of fashion. Can new forms and new informality be bred into the Zinnias? I believe so. Plant-breeders are experimenting with Dahlias, and both Dahlias and Zinnias have much in common with the varied China Asters and fanciful Japanese Chrysanthemums.

Ithaca, N. Y. *Wilhelm Miller.*

The Forest.

The Forest Reservations of Southern California.

AMONG the forest reservations set aside by executive orders of President Harrison and President Cleveland are three of great importance to southern California. These reservations are known as San Gabriel, San Bernardino and San Jacinto, and aggregate more than two million acres. The smallest is that of San Gabriel, the most westerly. The San Bernardino and the San Jacinto reservations, each of 737,280 acres, are about ninety miles from the ocean, on the slopes of the Sierras, which separate the fertile cultivated valleys of southern California from the Mojave and Colorado deserts. The longest slopes are toward these valleys, and are traversed by the numerous mountain streams which supply the whole section with water for irrigation and domestic purposes. From the bases of the mountains on the north and east stretch away broken, undulating and barren desert wastes, watered only by infrequent springs and wells.

The San Bernardino and San Jacinto reservations are almost continuous, being separated by the narrow pass of San Gorgonio. Together they form a large and immensely valuable forest reserve, which includes the three highest mountains in southern California, San Bernardino, San Gorgonio (sometimes called Grayback) and San Jacinto. San Gorgonio is the highest of the three, about 11,500 feet, but they are all noble and imposing. On San Bernardino and San Jacinto there is a sparse growth of timber nearly to the summit, but the timber line of San Gorgonio is several thousand feet below the summit, and the gray appearance of its barren crest, covered with masses of broken rock, has given it its popular name. Late in September of the present year I saw on the northern slope of San Gorgonio scattered patches of snow, the remnants of last winter's falling, and a day or two later its summit was whitened by the first light snow of the coming winter season.

The forests of these mountains do not compare in extent and majesty with those of northern California and of Oregon. From the lumberman's point of view they are insignificant, and, at a little distance, the transient tourist who views them only from the south and west, sees no forests worth mentioning and goes away with the impression that the slopes of the mountains are all barren. But when the cañons and the valleys are penetrated that lie between the successive ranges, especially in the north and east, forests are found that are certainly beautiful, if not of great commercial value. At intervals there are stretches where the Pines have crowded out all other trees, and one may ride for miles unimpeded by underbrush among their huge and towering trunks. But most of the forests are composite, principally made up of Pines, Firs, Balsams, Spruces, Larches and deciduous and Live Oaks. The streams are bordered by Willows and Alders. Occasionally a puny Maple is seen, very unlike the handsome Maples of the east, and the Bay-tree flourishes at certain altitudes. The forests of this region are between the altitudes of 4,000 and 8,000 feet.

In places the Chapparal is dense, made up of Manzanita, Buckthorn, wild Mahogany, the Madroña, Greasewood, etc. Some of these bushes are covered with long, silvery, frond-like blossoms or, as the Manzanita, for example, with red or scarlet berries. Holly and Mistletoe are frequently found, and many gay flowers, such as the Golden-rod, Clematis and the bright blossoms of various species of Cactus. Where there is moisture there are many varieties of Ferns.

These mountains were formerly overrun with animal life, but the too-ready rifle of the hunter has changed this condition. Grizzly and cinnamon bears and wild cats are still found occasionally in the deepest recesses. Deer are comparatively plentiful and hundreds are shot every season. Gray squirrels abound, although they are by no means as numerous as in former years. Brown squirrels and chipmunks, too insignificant to tempt even the most wanton marksman, are abundant. The streams are full of trout and are kept replenished from year to year from state hatcheries. The same variety, the California brook trout, in the waters of the only lake of this region, grows to enormous size. This lake also affords fine duck-shooting in the winter. The mountain quail, larger and handsomer than the quail of the valleys, is found in numbers. Doves are also plentiful. Among birds not fit for food are blue jays, woodpeckers, owls, hawks and condors. Of reptiles the rattlesnake is the only one of importance. Theoretically this venemous creature is a terror to many, who for this reason are unwilling to enter these regions. Practically, one may ride for days without seeing a single specimen, and the instances of injury from its bite are rare indeed.

A resort known as Seven Oaks is the centre of one of the most beautiful of the park-like districts among these mountains. This is a collection of tent-houses and log-cabins where hospitality is open-hearted and without ostentation, and where good company and good cheer may always be found. Here one may rest and study Nature or may plan and execute a great variety of fishing, hunting and camping excursions. The most convenient route to reach Seven Oaks is by wagon twelve miles from Redlands to a point near the western base of Mount San Bernardino. Thence a mountain trail, nine miles through

the forest, takes the traveler to his destination under the northern base of the same mountain. It is difficult to understand, without actual experience, how completely this day's ride isolates one from the busy workaday world.

On every hand mountains rim the valley in which Seven Oaks lies, with a distance of, perhaps, twenty miles in each direction from ridge to ridge. The Santa Ana River, the most important stream in this section of southern California, traverses the valley from east to west, finding its sources at the greatest elevations and fed by smaller tributary streams. From the heights above these waters one may look down, toward the east, upon the wide stretches of the deserts, broken by ranges of low hills with great variety of color and topography.

The Santa Ana curves to the northern side of this valley and between it and the heights of San Bernardino and Grayback, on the south and south-east, are wooded benches where one may ride for hours in the shade of beautiful trees. Bridle-paths, or trails, traverse them in different directions. Wherever there is moisture from springs or streams, mountain meadows or cienegas are found, and herds of cattle are pastured on these. In spring and summer the grass is abundant and luxuriant. The slopes on the northern side of this valley are less heavily wooded than on the south. On surmounting them the range could be crossed into another valley of less extent and at a higher elevation, about 6,000 feet above the sea, and here would be found Bear Valley Lake, a storage reservoir for irrigation purposes. Its outlet is Bear Creek, which rushes away to a junction with the Santa Ana, and the two, united, sweep on their course to the Orange-groves of southern California, their waters keeping the finest of these in health and productiveness. These valleys are among the most important, and are typical, in their general characteristics, of a series which extends from the ocean to the south-eastern slopes of San Jacinto, in a semicircular sweep of more than a hundred miles.

There are no mills for sawing lumber in this immediate vicinity, although there are a few farther westward. There are some mines, but most or all of these are on the desert-side of the range. Here and there a pioneer had acquired title to a bit of arable ground, with an appurtenant water-right, before these lands were set aside as a forest reservation, and some portions had been granted to railroads. All of these vested interests will, of course, have to be protected or adjusted in whatever regulations may be made for preserving these forests, but no intelligent man who has studied the subject at all could hesitate for an instant in his opinion as to the absolute necessity for preserving them. They shelter the sources of the waters upon which depend the prosperity of all of southern California. The orchards which they keep alive are worth not less than thirty-five millions of dollars, which is three times the amount invested in mines in southern California. Irrigation will depend more and more upon storage reservoirs, for the limits of available water-supply under the present system of use are already in sight. If these mountain valleys were denuded of their forests the winter rains would rush down their precipitous slopes in torrents, which would soon overflow the storage reservoirs, and there would be little or no flow of summer waters. Under such conditions Orange-growing in southern California would be a most hazardous occupation, if not impossible.

The deadliest foes to these forests have been not the miners, or even the lumbermen, but the sheep-herders and careless campers in whose wake came devastating forest fires. The sheep have now been driven away and the campers have seemingly been educated or frightened into greater care. It is certain that forest fires have been less frequent during the past summer than formerly. Appreciable efforts are being made to enforce the laws governing these reserves, and are effecting good results.

A new and important interest which will be useful in preserving these forests is that of the companies now being formed and some of them at work, for establishing plants to generate electricity by the fall of the same waters which furnish irrigation. Some of these plants will each be capable of developing as high as 10,000 horse power, which will be utilized in Los Angeles and at intermediate points for purposes of lighting, manufactures and transportation. These interests will be valuable and will help on the rapid development of southern California. But they, even more than irrigation, will demand a continuous supply of water which must not fall below a certain minimum. This flow must be maintained throughout the long dry summers, and every effort will be made to secure the volume of water and to lessen loss from evaporation by expensive systems of tunnels cut through the solid rock. These are very fascinating projects, and so feasible that they will doubtless rapidly be pushed to completion. Thus private interests may accomplish more in the end than the fear of the law or Government patrol toward maintaining the integrity of these reservations.

But roads will be needed in order that these plants may be constructed and maintained. By these roads these unique mountain nooks will be rendered accessible to the multitude, and their charm of isolation and primitive grandeur will be at an end. When the multitude comes into the forests the mountaineer, to whom they have been sacred, and by whom they have been loved, will have no other refuge than the desert. Progress, which is the greatest good to the greatest number, is destructive of romance and of the refined pleasures of the few to whom Nature in her lonely and rugged moods is a source of constant pleasure. Comparatively few Californians know their own mountains well. They dwell within sight of them, year after year, ignorant of the beauties which so abundantly repay the slight efforts and sacrifices involved in exploring them.

Redlands, Calif. *William M. Tisdale.*

Recent Publications.

Life Histories of American Insects. By Clarence Moores Weed. Illustrated. The Macmillan Company, London and New York. 1897.

In this, his latest book, the author seeks to give in an interesting, readable, untechnical way some account of the transformations and short lives of a few of our common or most conspicuous insects, chiefly those to be found in the northern or middle portions of this country. The book is divided into twenty-six chapters, each one of which treats of some particular species of insect, or a species and its nearest allies, the last two chapters being devoted to true spiders and so-called "harvest spiders." No attempt is made to give a complete history of any species, nor is any claim made to entire originality, although many of the observations are no doubt the result of Professor Weed's own careful studies. In a pleasing, brief, instructive way some of the salient facts in the life history of the insect are touched upon, the end of each short chapter leaving much unsaid that might be told, but giving the reader a desire for more information, and perhaps leading him to the still more pleasant and profitable task of personal investigation. The range of subjects is well chosen to illustrate types or modes of life in the insect world, although wood-borers and some others which come under common observation or speculation are not referred to. A chapter or two each given to water lovers, earth-burrowers, leaf-eaters, leaf-miners, case-bearers, predaceous insects, those which are parasitic, etc., are sufficient to give the tyro a good idea of some of the things he should see in the insect life about him and which too commonly pass unnoticed. It would add greatly to the cause of economic entomology and to the proper understanding of our insect friends and foes if such books as Professor Weed's were more commonly read, for such reading must inevitably lead any thoughtful mind to further study or the desire for it. The chapter on "Sand-wasps and their Victims" must open the eyes of many readers to episodes in insect life occurring commonly about them, facts familiar to entomologists, but scarcely known except by students of that branch of natural science. Much might be quoted here, but such quotations would give but a slight idea of the many interesting observations on insect life presented in an attractive and popular form in this volume.

This book might well be used as a reader in connection with the science-teaching in some of our schools. The pages are abundantly illustrated with original or more familiar figures borrowed from other works; and it is pleasing to add that proper credit is always given to other authors or publishers for any observations or figures which have been borrowed.

Notes.

A market garden at Gretna, Louisiana, managed by a Chinese company, is briefly described in *The Rural New-Yorker*. Besides Cow Peas, used on old land, a fluid obtained from decom-

posed fish is depended on to fertilize the soil. In the intensive system of cultivation practiced a cupful of this ill-smelling fluid is poured at the root of each plant. Only the Chinese trade is supplied, and the chief vegetables grown are Pumpkins, Okra, Yams, Cabbage and several members of the Cucumber tribe.

It appears from a note printed in the October issue of *The Kew Bulletin of Miscellaneous Information* that the so-called bandoline wood is derived from Machilus Thunbergii, a relative of our Sassafras-tree. The shavings and chips of the wood when soaked in cold water yield a viscid mucilage-like matter which is used by Chinese ladies in bandolining their hair. This tree is a native of southern Japan, Formosa and south-eastern China, and is an exceedingly handsome evergreen with elongated leathery lustrous leaves.

The crop of chestnuts is disappointing in quantity this season owing to dry weather in August, when the nuts should fill out rapidly. Sound chestnuts of ordinary size from nearby northern states sell for twenty cents a pound in this city. This shortage is particularly evident in the lack of offerings by Italian vendors on the sidewalks. Hickory-nuts are abundant, and the best shell-barks sell for ten cents a quart. Black walnuts are not yet in market. Butternuts, from Vermont, sell for twenty-five cents a half-peck in their hulls.

In the first issue of *The Plant World*, a monthly journal of popular botany, Dr. F. H. Knowlton, the editor, calls attention to the existence in a swamp near Laurel, Prince George's County, Maryland, of a form of Lilium superbum with stems seven or eight feet tall and clear lemon-yellow flowers without spots, but with large bright green triangular markings at the base of the perianth-segments. The leaves are described as similar to those of the common form, although perhaps more scattered, and the flowers are similar in size and shape. Although not abundant, it appears that this plant has been known locally for many years and that a few specimens can be found every year.

A writer in the October issue of *Forest Leaves* describes two White Pine-trees on the farm of Miss Gallagher, in Allegheny township, Cambria County, Pennsylvania, which are believed to be the two largest trees in the state. The trunk of one of these trees is oval shaped, the longer diameter being over eleven feet and the shorter nearly seven feet. About twenty feet from the ground the trunk divides into a dozen branches, the principal one being about thirty inches in diameter and ninety feet high. The smaller tree is seven feet in diameter. A finger-board which formerly stood on the road from Cresson to Loretto at a side road two miles from Cresson bore the legend "This way to the Big Trees."

From a recent number of the *Pharmaceutical Journal* it appears that in November, 1895, an ordinance was promulgated in Corea legalizing the export of Ginseng. For centuries red Ginseng has been sent to Pekin by the overland embassy, the trade being a royal monopoly from which the King of Corea derived the principal portion of his revenue, the export by sea being prohibited. The annual crop is limited in quantity to about 15,000 catties, upon which an excise duty of $10 a catty is charged under the new regulations, to which is added an import duty of five per cent ad valorem, levied on its arrival at a treaty port in China. Under the new law the King is compensated for his loss of the Ginseng monopoly by an equivalent addition to the privy purse.

In his enthusiasm over the beauty of the form of Apera arundinacea, in last week's issue of Garden and Forest, Mr. Watson did not fully describe the coloring of this handsome Pheasant Grass. The common name is aptly given for its browns and reddish browns, distinctive of the attractive bird, and perhaps no other Grass is so quaintly and highly colored. T. Smith, of Newry, Ireland, introduced this species some years ago, but it seems to have only lately attracted attention. It is one of the handsomest Grasses. While hardy, it seems to require care in removal or transplanting, and springtime appears to be the proper season for planting out. Like all the noble Grasses, this should be grown as an isolated specimen, or, at least, separate from other Grasses.

A writer in a recent number of *La Semaine Horticole* estimates the possible length of life of a number of European trees, basing his calculations on many measurements. Such estimates are, of course, interesting, although the length of life of any tree depends so much on conditions of soil and on immunity from accidents that they must be taken with many allowances. The following are his estimates: Judas-tree (Cercis Siliquastrum), 300 years; Elm (Ulmus campestris), 335; Ivy (Hedera helix), 450; Field Maple (Acer campestre), 516; Birch (Betula alba), 576; Orange (Citrus Aurantium), 630; Cypress (Cupressus sempervirens), 800; Walnut (Juglans regia), 900; Plane (Platanus orientalis), 1,000; Linden, 1,100; Norway Spruce, 1,200; Oak (Quercus Robur), 1,500; Cedar of Lebanon (Cedrus Libani), 2,000; and Yew (Taxus baccata), 3,200 years, while to our Southern or Bald Cypress (Taxodium) a length of life of 3,000 years is ascribed.

One of the most delightful American trees in autumn is certainly the Sassafras when it becomes conspicuous in the landscape by the varied tints of the delicate orange coloring of its leaves, and this year it has been unusually beautiful. But it is not in autumn alone that the Sassafras is attractive and interesting; in winter its bright green, lustrous branches make a cheerful note on the margin of the forest; in spring it is charming, with its drooping clusters of delicate yellow flowers surrounded by the enlarged and showy scales of the expanding buds; all summer long its variously shaped fragrant leaves retain their healthy luxuriance; and the fruit, which birds rarely allow to remain long on the branches, is showy, with deep blue berries and much thickened and scarlet cups. Few people plant the Sassafras, perhaps because it is a native tree, and nurserymen rarely offer it for sale. Large plants are difficult to transplant, as the thick, fleshy roots are scantily provided with rootlets, but small plants which can often be found in abundance along fence-rows and wood borders, are easily managed and grow rapidly when set in good soil. With many other common American trees the Sassafras ought to be often planted in American parks and along the margins of American highways.

Of the exotic trees recently introduced into American gardens one of the most promising is the Japanese Prunus Pseudo-cerasus, which has for several years proved hardy in the Arnold Arboretum, where it is growing rapidly and has not yet been attacked by insects or fungal diseases. Forms of this tree or of some allied species with double flowers are now rather common garden plants in the United States and Europe, but these are less hardy and of much slower growth than the wild type which appears to be rare in American collections. It is the largest tree of the Rose family in Japan and, next to the Apricot, more cultivated for its flowers by the Japanese than any other tree. In the forests of Yezo, where it is very common and sometimes eighty feet high with a trunk three feet in diameter, it resembles in the appearance of the bark and in habit the wild type of Prunus Cerasus, the Cherry-tree of our gardens, and it might be mistaken for that species. In autumn it is particularly beautiful, as the leaves turn deep scarlet and light up the forest before the Maples assume their brightest colors. For centuries this Cherry has been used in Japanese gardens and temple grounds, and near Tōkyō there is a Cherry avenue more than a mile in length along the banks of the Sumi-da-gawa, and at Koganei ten thousand of these trees were planted a century and a half ago in an avenue several miles long. It is a valuable timber-tree in Japan, and, if it proves unattractive to insects in this country, it may prove useful here in forest as well as in ornamental plantations.

Our London correspondent, Mr. William Watson, publishes in a recent issue of *The Gardeners' Chronicle* some interesting notes on the creeping species of Ficus now in cultivation. They are F. radicans of gardens, although that name has been given by Roxburgh to another plant; F. stipulata, popularly known as F. repens, with a smaller-leaved form known as F. minima; F. falcata and F. barbata. F. radicans is a useful evergreen for covering walls, pillars, etc., in warm houses. There is a variety variegata with leaves marbled and margined with white. F. stipulata, or repens, is the plant commonly found in American hot-houses. It is a native of Japan and China, and has been cultivated in Europe for a hundred and twenty-five years. This climbing Fig is hardy in the southern states and in California, and in countries of such temperate climates is one of the most useful of all evergreens for covering walls or the sides of buildings. F. falcata, which has recently been introduced into English gardens by Low & Company, is a native of the Malayan Peninsula and Archipelago, where it is not uncommon on trees and rocks. By Dr. King, the author of the classical monograph of the Asiatic species of Ficus, it is described as "a very remarkable and beautiful species, varying much in fruit and in the shape of the leaves, even in the same plant, the leaves on its small branchlets from the lower part of the main stem being often much smaller than those from branchlets near the apex, and occasionally different in form." F. barbata, which is a native also of Malaya, is a more vigorous plant, with hairy leaves often six inches in length, and is occasionally cultivated in European hot-houses to cover Palm-stems and pillars.